

CLAIMS

1. A waste collector device comprising a receptacle (1) in which a plastics bin liner bag (2) is placed, the device comprising:

5       · a storage compartment (4) for storing a covering (2<sub>1</sub>) in the form of a sheath or sock for forming a bag (2) and made of a plastics film, said covering (2<sub>1</sub>) being contained in a storage compartment (4), preferably in folded form, said compartment (4) being situated in the  
10 top portion of said receptacle (1), preferably inside it;

· drive means (6<sub>1</sub>, 6<sub>2</sub>) suitable for delivering said covering from said storage compartment (4) inside of said receptacle (1) to form said bag, preferably down to the bottom (1<sub>1</sub>) of said receptacle (1);

15       · seal and cutter means (10<sub>1</sub>, 10<sub>2</sub>), preferably operating by heat-sealing and hot-cutting, for sealing and cutting said covering (2<sub>1</sub>), enabling a said bag (2) to be made from said covering leaving said compartment (4), and subsequently enabling a said bag (2) to be closed and  
20 separated from the remainder of said covering once the bag has been filled with waste (20); and

· said storage compartment (4) being disposed in such a manner as to define a top central orifice (1<sub>2</sub>) of said receptacle (1) through which waste (20) can be  
25 introduced into said bag (2);

the device being characterized in that:

· it further comprises means (17, 18<sub>1</sub>, 18<sub>2</sub>) for opening and closing said central orifice (1<sub>2</sub>) in the top portion of said receptacle (1) through which it is  
30 possible to introduce waste (20) into said bag (2), opening of said central orifice (1<sub>2</sub>) being triggered when an article such as some waste is detected over said central orifice, and said central orifice (1<sub>2</sub>) being kept closed between two occasions on which waste (20) is  
35 introduced, said means (17, 18<sub>1</sub>, 18<sub>2</sub>) for opening and closing said central orifice being situated above said drive means (6<sub>1</sub>, 6<sub>2</sub>); and

· said drive means ( $6_1$ ,  $6_2$ ) are suitable:

5 · for adopting a disengaged position in which they define an opening in the top margin of the bag enabling waste to be introduced therein without coming into contact with the open two margin of said covering; and

10 · for moving so as to pinch said plastics film covering coming from said compartment in the central region of said receptacle to enable said bag to be entrained, and where appropriate to be lowered down to the bottom of said receptacle.

2. A device according to any one of claims 1 to 3, characterized in that said drive means ( $6_1$ ,  $6_2$ ) are 15 constituted by first rollers ( $6_1$ ,  $6_2$ ) situated in said receptacle beneath said storage compartment (4), which said storage compartment (4) is located against the inside periphery of said receptacle (1) in such a manner as to define a top central orifice ( $1_2$ ) of said receptacle 20 (1) through which said waste (20) can be introduced into a said bag (2), and said first rollers ( $6_1$ ,  $6_2$ ) are suitable for moving from two opposite sides ( $1_3$ ,  $1_4$ ) of said receptacle (1) until they pinch said plastics film covering ( $2_1$ ) coming from said compartment (4) in the center region of said receptacle (1), and enable said bag 25 to be driven and lowered to the bottom ( $1_1$ ) of said receptacle (1) by rotating said first rollers ( $6_1$ ,  $6_2$ ).

3. A device according to claim 1, characterized in that 30 said first rollers ( $6_1$ ,  $6_2$ ) are disposed in parallel, facing each other horizontally, and against or close to two opposite sides ( $1_3$ ,  $1_4$ ) of said receptacle (1), and are suitable for being moved mechanically in horizontal translation in a direction perpendicular to their 35 horizontal axes from a disengaged position enabling waste to be introduced into said bag through said central open orifice (1) without coming into contact with the top

margin of said bag, to a close-together position towards the center of said receptacle in which they pinch said covering and enable it to be driven, and where appropriate to be closed.

5

4. A device according to any one of claims 1 to 3, characterized in that said seal and cutter means ( $10_1$ ,  $10_2$ ) enable the following steps to be performed:

a) closing the open margin of said covering ( $2_1$ ) in the form of a sock coming from said storage compartment (4) so as to make the bottom of a said bag (2) prior to lowering it to the bottom ( $1_1$ ) of said receptacle (1);

b) closing a bag (2) that is completely or partially filled with waste (20);

c) preferably, separating a said bag (2) after it has been closed, by cutting said plastics film covering above the zone corresponding to the sealed closure of the top margin of said full bag;

d) preferably piercing part of the top margin of a said bag (2) above said closure zone so as to constitute a handle ( $2_1$ ) in the full bag that is to be removed; and

e) closing the bottom end of the margin of the covering coming from said compartment (4) by heat-sealing above the zone that corresponds to said separation cut mentioned in step c), or where appropriate above said handle ( $2_1$ ) mentioned in step d).

5. A device according to claim 4, characterized in that said drive means ( $6_1$ ,  $6_2$ ) and said seal and cutter means ( $10_1$ ,  $10_2$ ) are situated in the top portion of said

receptacle (1) and are suitable for co-operating in such a manner as to be capable of sealing said plastics film so as to close a bottom of a said bag (2) in said steps a) and e), prior to lowering said bag (2) to the bottom ( $1_1$ ) of said receptacle (1), and where appropriate after

or together with said closure of the top margin of a said

full bag in step b), and where appropriate after said cuts of steps c) and d).

6. A device according to claims 1 to 5, characterized in  
5 that said heat-seal and hot-cutter means ( $10_1$ ,  $10_2$ ) are suitable for performing said steps a) to e) simultaneously, and preferably comprise two heat-seal plates ( $10_1$ ,  $10_2$ ) placed facing each other in parallel and suitable for moving from two opposite sides ( $1_3$ ,  $1_4$ ) of  
10 said receptacle (1) into the center region of said receptacle, pinching said plastics film covering ( $2_1$ ) between said two heat-seal and hot-cutter plates ( $10_1$ ,  $10_2$ ).

15 7. A device according to claim 5 and 6, characterized in that said heat-seal and hot-cutter plates ( $10_1$ ,  $10_2$ ) are placed below said first drive rollers ( $6_1$ ,  $6_2$ ) respectively, and are suitable for co-operating therewith so that when said two first drive rollers ( $6_1$ ,  $6_2$ ) are  
20 rotated so as to enable said bag to be placed at the bottom ( $1_1$ ) of said receptacle (1), said heat-seal and hot-cutter plates ( $10_1$ ,  $10_2$ ) are in a spaced-apart position so as to allow said bag (2) to pass through and be lowered between them.

25 8. A device according to claim 7, characterized in that said heat-seal and hot-cutter plates ( $10_1$ ,  $10_2$ ) are disposed respectively beneath said first drive rollers ( $6_1$ ,  $6_2$ ) and are secured thereto, said first rollers ( $6_1$ ,  
30  $6_2$ ) being mounted in flexible manner so that when they are in a position pinching a said covering, it is still possible to move said heat-seal and hot-cutter plates ( $10_1$ ,  $10_2$ ) against each other in the center of said receptacle (1) in order to perform said heat-sealing and  
35 said hot-cutting of said covering ( $2_1$ ) pinched between said two plates ( $10_1$ ,  $10_2$ ).

9. A device according to claims 1 to 8, characterized in  
that it includes compactor means (14<sub>1</sub>, 14<sub>2</sub>) suitable for  
applying pressure against the film constituting the bag  
5 (2) once it is partially or completely filled with waste  
5 (20), said pressure being applied to the outside of the  
bag.

10. A device according to claim 9, characterized in that  
said compactor means comprise pivotally-mounted compactor  
10 bars (14<sub>1</sub>, 14<sub>2</sub>) situated beneath said heat-seal and hot-  
cutter means (10<sub>1</sub>, 10<sub>2</sub>) and suitable for pivoting from a  
rest position in which said bars (14<sub>1</sub>, 14<sub>2</sub>) are disposed  
against respective opposite sides (1<sub>3</sub>, 1<sub>4</sub>) of said  
receptacle to a tilted position obtained by pivoting  
15 about respective pivot axes (14<sub>3</sub>, 14<sub>4</sub>) situated at their  
bottom ends which are secured against said respective  
opposite sides (1<sub>3</sub>, 1<sub>4</sub>) of said receptacle (1) until the  
top ends of said bars (14<sub>1</sub>, 14<sub>2</sub>) reach the center region  
of said receptacle (1).

20 11. A device according to claim 9 or claim 10,  
characterized in that said compactor means (14<sub>1</sub>, 14<sub>2</sub>) is  
actuated automatically using a photoelectric cell or a  
sensor, as soon as a said bag (2) is more than half full,  
25 and preferably after each new introduction of waste (20)  
into said bag (2), and then when said bag (2) is  
completely full, said compactor means (14<sub>1</sub>, 14<sub>2</sub>) are  
maintained in the compacting position until after said  
heat-sealing and/or said hot-cutting for closing said  
30 full bag and, where appropriate, for separating it.

12. A device according to claim 8 or claim 9,  
characterized in that said compactor arms (14<sub>1</sub>, 14<sub>2</sub>)  
include flexible or semi-rigid strips tensioned across  
35 rigid frames (14<sub>5</sub>) so that when said compactor strips  
(14<sub>1</sub>, 14<sub>2</sub>) encounter said bag (2) filled with said  
incompressible waste (20), said compactor strips deform,

thereby avoiding tearing said plastics bag, and said pivoting of said compactor strip is interrupted on encountering resistance corresponding to a predetermined compacting pressure.

5

13. A device according to any one of claims 1 to 12, characterized in that it includes means (17, 18<sub>1</sub>, 18<sub>5</sub>) for opening and closing a central orifice (1<sub>2</sub>) in the top portion of said receptacle (1) through which waste (20) is introduced into said bag (2), said opening and closing means (17) being controlled automatically by means of a photoelectric cell or a sensor so as to keep said receptacle (1) closed between two occasions on which waste (20) is introduced, and so as to cause said central orifice (1<sub>2</sub>) to open when an article such as waste (20) is presented over the location corresponding to said central orifice (1<sub>2</sub>).

14. A device according to claim 13, characterized in that said opening and closing means (17) comprising a moving strip wound between two second rollers (18<sub>1</sub>, 18<sub>2</sub>) disposed respectively against two opposite sides (1<sub>5</sub>, 1<sub>6</sub>) of said receptacle (1) over said storage compartment (4), with movement of said strip (17) being obtained by rotating said second rollers (18<sub>1</sub>, 18<sub>2</sub>), said moving strip including an opening, preferably of substantially the same shape as said central orifice (1<sub>2</sub>), so that when said opening coincides with said central orifice (1<sub>2</sub>) said receptacle is in an open position allowing waste (20) to be introduced, and when a solid portion of said strip (17) completely covers said top central orifice (1<sub>2</sub>), said receptacle is in a closed position, thereby confining said waste inside said receptacle (1).

35 15. A device according to any one of claims 1 to 14, characterized in that said bag (2) is put into place at the bottom (1<sub>1</sub>) of said receptacle (1) inside a box (3),

said box (3) being secured to at least a bottom portion (3<sub>1</sub>) of one of the sides (1<sub>5</sub>) of said receptacle (1), and said box resting on slider means enabling a said bag (2) to be removed by pulling said bottom portion of the side 5 (1<sub>3</sub>, 1<sub>4</sub>) of the receptacle (1) that is secured to said box (3).

16. A device according to any one of claims 1 to 15, characterized in that it is fitted with electronic means 10 (22) enabling the various steps listed below to be controlled and synchronized as a function of information received from said photoelectric cells or sensors:

- 1) closing and opening said central orifice (1<sub>2</sub>);
- 2) driving said plastics film covering (2<sub>1</sub>) for 15 forming the bag (2) so as to put into place at the bottom (1<sub>1</sub>) of said receptacle (1);
- 3) performing said compacting steps using said compactor means (14<sub>1</sub>, 14<sub>2</sub>);
- 4) performing said sealing and cutting steps using 20 said seal and cutter means (10<sub>1</sub>, 10<sub>2</sub>); and
- 5) interrupting the above steps in the event of a bag (2) being removed out from said receptacle (1).

17. A method of collecting waste with a device according 25 to any one of claims 1 to 16.

18. A method according to claim 17, characterized in that the following steps are performed in succession:

- 1) sealing and cutting said covering to form the 30 bottom of a said bag using said seal and cutter means (10<sub>1</sub>, 10<sub>2</sub>);
- 2) driving said bag inside said receptacle, preferably to the bottom of said receptacle, using said drive means (6<sub>1</sub>, 6<sub>2</sub>);
- 3) putting said drive means in a disengagement 35 position in which they define an opening at the top

margin of the bag, enabling waste to be introduced therein;

4) opening said central orifice (1<sub>2</sub>) using said closing and opening means (17, 18<sub>1</sub>, 18<sub>2</sub>) whenever waste is  
5 detected above said central orifice (1<sub>2</sub>);

5) inserting said waste through said open central orifice (1<sub>2</sub>), said waste being collected in the bottom of a said bag;

6) closing said central orifice (1<sub>2</sub>) using said means  
10 (17, 18<sub>1</sub>, 18<sub>2</sub>) for closing and opening central orifice (1<sub>2</sub>) immediately after said waste has been introduced through said central orifice (1<sub>2</sub>) opened in step 2);

7) where appropriate, compacting said bag using said compactor means (14<sub>1</sub>, 14<sub>2</sub>);

15 8) sealing and cutting the top margin of said bag once full of waste using said seal and cutter means (10<sub>1</sub>, 10<sub>2</sub>); and

9) where appropriate, removing said bag from said receptacle.